22 Sep 1992

VO8MT-A

VOLTMETER, PHASE ANGLE

**1. GENERAL.** This procurement requires a general purpose, self-contained, wideband phase angle voltmeter.

**2. CLASSIFICATION.** Type II, Class 5, Style E, and Color R in accordance with MIL-T-28800 for shipboard applications.

**3. OPERATIONAL REQUIREMENTS.** The equipment shall be capable of measuring the true phase angle between two alternating voltages, the absolute fundamental amplitude without the presence of reference voltage, and the in-phase and quadrature-phase amplitude of alternating voltage over the frequency range specified below. The equipment shall be capable of measuring the in-phase and quadrature nulls of the input signal, and shall have the capability of phase shifting the reference 360°. The equipment shall function as a conventional voltmeter measuring the total voltage over the specified frequency range.

**3.1 Frequency range.** 10 Hz to 100 kHz.

**3.2 Phase angle range.** 0° to 360°.

**3.3 Voltage range.** 300 μV to 300 Vrms full scale.

**3.4 Inputs.**

**3.4.1 Reference channel.** The reference channel shall be isolated from the equipment chassis and the signal channel. Reference input range: 150 mVrms to 200 Vrms.

**3.4.2 Signal channel.** The signal channel shall be isolated from the equipment chassis and the reference channel. Signal input range: 1 mVrms to 300 Vrms.

**3.5 Harmonic rejection.** 45 dB minimum.

**3.6 Phase accuracy.** ±0.5° from 10 Hz to 50 kHz, ±1.0° from 50 kHz to 100 kHz.

**3.7 Voltage accuracy.** ±2% of full scale.

**3.8 Input RC.**

**3.8.1 Reference channel.** 1 megohm or greater paralleled by 200 pF or less.

**3.8.2 Signal channel.** 1 megohm or greater paralleled by 200 pF or less.

**3.9 Readout devices.**

**3.9.1 Phase angle readout device.** The phase angle shall be displayed in degrees on either an analog meter, calibrated dial(s), or on an equivalent digital display. Resolution: 0.1° or better.

**3.9.2 Voltage readout device.** The voltage shall be displayed on a zero-centered meter or an equivalent digital display. The space between zero and full scale on the most sensitive range shall have at least 30 equally spaced divisions. If a digital display is provided, polarity identification and an analog or bar-graph meter for use in nulling shall be provided. The null meter shall be at least equivalent to a panel meter

having a scale length of 2 inches. Resolution: 4 1/2 digits. Null sensitivity: 3 μV.

## 4. GENERAL REQUIREMENTS.

**4.1 Power source.** MIL-T-28800 nominal power source requirements are invoked. Maximum power consumption: 80W.

**4.2 Weight.** 20 kg (44 lb) maximum.

**4.3 Digital interface.** A digital interface is required in accordance with MIL-T-28800.

**4.4 Lithium batteries.** Per MIL-T-28800, lithium batteries are prohibited without prior authorization. A request for approval for the use of lithium batteries, including those encapsulated in integrated circuits, shall be submitted to the procuring activity at the time of submission of proposals. Approval shall apply only to the specific model proposed.